Lethality on Today’s Battlefield

GEZA PAP
Associate Technical Director
For
Development & Production

Prox Fuze Development in WW II

- Development :
  - 2,236 people
  - labor cost of $837,000,000
- Procurement :
  - Contracts - $510 million in 1942, increasing to $3.8 billion in 1945
  - Quantities - over twenty-two million fuzes - about $8.5 billion
  - Unit Cost: $150.
  - Supplier Base - more than two thousand interlocking suppliers and sub-suppliers that poured components into six prime fuze contractors."
- Schedule :
  - May 41 - Concept demo
  - Nov 42 – Production Decision
  - Jan 43 – FIRST KILL

$ in '02 dollars

a Baseline
for
Lethality Today

Today's War in Perspective

- Newsweek 26-May-03 Pg. 10 Periscope -John Barry
- **War Costs: How Much? Well, How High Can You Count?**
  - Defense Secretary Donald Rumsfeld has ordered the U.S. military to collaborate on a "lessons learned" study of the Iraq war. That will take months, but the air commander, Lt. Gen. Michael Moseley, has had a team from his "analysis and assessments" staff compile some raw numbers. Some highlights of the 16-page report: **423,998 U.S. military personnel were deployed**; other Coalition forces sent an additional 42,987 troops. The total is roughly equivalent to the population of Albuquerque, N.M. **The war lasted 720 hours**. The allies flew more than 41,400 sorties. That consumed 18,622 tons of fuel, enough to keep a Boeing 737-300 airliner aloft for about 12 years. The Coalition flew 1,801 aircraft-all but 138 were American.
  - The Iraqis were showered with 31,800,000 leaflets bearing 81 different messages. End to end, the leaflets would have made 120,454 rolls of toilet paper. Coalition forces lost 20 aircraft, but only 7 as a result of enemy fire. Search-and-rescue teams flew 55 missions and saved 73 people. 80 aircraft were flown to gather intelligence; they took 42,000 pictures of the battlefield, transmitted 3,200 hours of video and eavesdropped on 2,400 hours of Iraqi communications.
  - **Known costs: $917,744,361.55**
  - **Amount equivalent to 46 minutes, 10.5 seconds' worth of total U.S. economic output in 2001.**

CNN - March 19, 2003

(can't always believe what's fit to print?)

All over the map

Estimates of the costs of war in Iraq run from $27 billion for military costs alone in the best-case scenario, to $1.92 trillion in the worst possible universe, a number that includes the costs of war, rebuilding and a bad economy.

Reported White House supplemental budget request:	$95B*
Former White House adviser Larry Lindsey:	$100B to $200B**
White House OMB Director Mitch Daniels:	$50B to $60B**
House Democrats:	$93B**
Congressional Budget Office:	$27B to $31B***
Center for Strategic and Budgetary Assessments:	$127B to $688B****
Yale professor William Nordhaus:	$99B to $1.92 trillion*****

**Only includes costs through Sept. 2003*

***Does not include occupation, rebuilding costs*

****Assuming two months of war; does not include occupation, rebuilding costs*

*****Includes military, rebuilding and other costs*

******Includes military, rebuilding costs and impact of oil, economy*

Amount equivalent to 73 hours worth of total U.S. economic output in 2001.

What went to War ?

Class of Items	Initially shipped into country	Percentage Expended
	114,885,203	45
	4,676,026	30
	3,205,307	50
	37,065	16
	6,825	5
Mortar/120mm	51,392	2
105mm		5
120mm		20
120		10
15		20
15		15
Gr		40
Grena		30
AT4		
Demo Mtls	,554,061	
Signals/Flares	170,285	
Rockets/2.75 Inch	47,965	
Mines	162,446	
Smoke Pots	2,429	
Other items	4,884	
TOTAL	127,140,263	4

Value Shipped:
ALL Conventional Munitions
$1.4 billion
(16% of the Prox Fuze)

Value Expended:
ALL Conventional Munitions
Probably
Less than 30 minutes worth
of the Nation's business

300 "lethality" items per soldier
(average unit cost of $10)

Reset – Replenish - Restock

Top 20 Suppliers		
ATK		
GD		
Datron (IMCO)		
AO		
Chamberlain		
MEI		
D&Z –		
Kilgore –		31.47
W	2.4%	30.21
	1.9%	23.92
	1.7%	21.40
	1.6%	20.14
	1.4%	17.62
	1.3%	16.36
	1.1%	13.85
	1.1%	13.85
	0.9%	11.33
MTD –	0.8%	10.07
Teknocraft	0.8%	10.07
Kaman Dayron	0.7%	8.81
Top twenty producers 94.75% of business		1,258.82

Less money in '02 contracts than the value of the Ammunition shipped

Estimate:
6 Months of Production to replace 30 Days of Fighting

Where Does Lethality come from?

DefenseNews.com

7-May-03

Return to Defense News Top 100

Rank	Company	Country	Principal Lines Of Defense Business	2000 Rank	2001 Defense Revenue*	2001 Total Revenue*	Percent of Revenue From Defense
6	General Dynamics Corp.	U.S.	AV,C,DE,E,IT,MU,NV,O,SI	5	7,784.00	12,163.00	64
26	Textron Inc.	U.S.	A,AV,C,DE,H,MU,M,MD,NV,O,SI,U	19	1,439.00	12,321.00	11.7
32	Snecma	France	A,C,DE,E,H,MU,M,MD,O,PS,SP	39	1,070.30	6,071.80	17.6
34	DynCorp	U.S.	A,C,DE,E,H,IT,MU,NV,O,PS,SI,T	33	1,000.00	2,000.00	50
46	Rafael Armament Development Authority	Israel	AV,C,M,O,SI	44	760	760	100
80	Kaman Corp.	U.S.	A,H,O	NR	301.6	876.9	34.4
3	BAE SYSTEMS plc	U.K.	A,AR,C,DE,IT,MU,M,MD,NV,O,SI,U	4	14,491.80	19,069.80	76
23	Alliant Techsystems (10)	U.S.	AR,DE,M,MD,O,SP	31	1,600.00	1,800.00	88.9
27	Rheinmetall DeTec AG	Germany	AV,AR,C,DE,MU,M,O,PS,SI,U	38	1,348.90	4,078.30	33.1
43	Singapore Technologies Engineering Ltd.	Singapore	U	40	773	1,335.20	57.9
50	GIAT Industries (8)	France	AR,AV,MU,O	54	666.6	701.7	95
51	Ruag Suisse	Switzerland	A,AV,AR,C,DE,H,MU,M,O,SP,SI	47	$597.80	$597.80	100
53	Diehl Stiftung & Co.	Germany	AR,DE,MU,M,O	[illegible]	531.6	604.3	88
62	Israel Military Industries Ltd.	Israel	A,AV,AR,DE,H,M[illegible]	[illegible]	[illegible]	435.4	99.4
76	ADI Ltd.	Australia	AV,AR,C,DE,[illegible]	[illegible]	[illegible]	366.8	85.4
15	Finmeccanica SpA	Italy	A,AV,AR,C,[illegible]	[illegible]	[illegible]	5,998.20	39.4
20	L-3 Communications Corp.	U.S.	A,AR,C,DE,H,[illegible]	[illegible]	[illegible]	2,347.40	76.9
29	Israel Aircraft Industries Ltd.	Israel	A,AV,AR,C,DE,[illegible] U	[illegible]	[illegible]	2,089.00	62.3
48	Elbit Systems Ltd.	Israel	A,AV,AR,C,DE,H,IT,MU,NV,[illegible]	[illegible]	729	764.5	95.4
52	Krauss-Maffei Wegmann GmbH & Co. Kg.	Germany	AV,AR	42	593.6	593.6	100
89	Oboronitelniye Systemy	Russia	A,AR	NR	259.2	NA	NA
91	Vickers Defence Systems Ltd. (17)	U.K.	AR,DE,SI	NR	232.2	232.2	100

Armaments is NOT just from US companies

That's the BIG picture

- It take us MINUTES, as a Nation, to make enough bullets take out an adversary like Iraq
  - Lethality is not a big, visible, pricey subject
- Global supply chain – or global competition?
  - We have fewer people, fewer US companies working ALL ammunition programs today than we had for one Fuze in WW II
- What about Details?

Designer Weapons?

M211 Aircraf	Urgent MR approved on 16 Jan 03.
M212 A	Urgent MR approved on 16 Jan 03.
M101	Full MR approved on 27 Jan 03.
M101	Full MR approved on 27 Jan 03.
NL Ca	Urgent MR approved on 13 Feb 03.
M84 Stu	Urgent MR approved on 13 Feb 03.
XM1131 Fire Su DEC Support Statement)	Interim MR approved on 13 Feb 03.
NL Capability Sets (1 Set)	Urgent MR approved on 19 Feb 03.
Ctg, 120mm, HE-OR-T, M908	Full MR approved on 5 Mar 03.
M84 Stun Grenade	Conditional MR approved on 10 Mar 03.
M4 SLAM	Full
M320 SLAM Trainer	
M255A1 Flechette Rocket (ARDEC MR Cert for JMC)	r 03.
M930 120mm Illum Ctg	
M120 Towed Mortar System	ar 03.
M121 Carrier Mounted Mortar System	Co Mar 03.
ACOG Optic	Urgent MR Apr 03.
C-More Optic	Urgent MR approved on 7 Apr 03.
M231 MACS Propelling Charge	Full MR approved on 22 Apr 03.
M241 MACS	Full MR approved on 22 Apr 03.
EOD PA	Urgent MR approved on 5 May 03.
NL Ca	Urgent MR approved on 5 May 03.
Towe 00A1 MTS with modifie	Conditional MR in process.
Advanced	Urgent MR in process.
XM1060 Thermo	Urgent MR in process.

20+ releases of new items to field Jan-May

ALMOST ALL URGENT

Special Needs Non-Lethal Predominate

How Did we do?

- "Precision artillery" is a natural partner to "precision airpower" in ... thers.
- ...ible munitions may be needed, along with systems like ... connaissance and illuminators to allow ground troops to ... targeting without being exposed to combat.
- Gas plugs on the 7.62mm MG have been the biggest maintenance issue. Units have now taken the spare barrel gas plug; put it in a 7.62 ammo can with enough JP-8 to cover the plug.
- Civilian graphite is the key (Cooper or Liquid W... several PSG's. Weapons gum up bad with CLP... lubricant of use.
- There has been a few ammunition problems, ma... ammunition being delivered to units. Many ISO cont... ...ecessarily opened to identify the contents. The radio frequency ... system worked well until the ISO shipping containers ... the field
- ...d scouts viewed the effect of the 50 cal round as a combat ... due to the psychological impact on other combatants that ...e destruction of the target.
- ...molition Kits ~ The new electric firing system received "rave reviews." It was considered safer and more effective.

Did well, but can do better

dust is a problem for guns & keyboards

Ammo handling & RE-Packaging challenge

Firepower

- Overall, very little SABOT was used
  - Devastating effects when used
- Heat and MPAT ended up being the preferred main gun round
  - Effective against buildings and bunkers
- Crew served machine guns ended up being weapon of choice in numerous engagements
  - Target rich environment
  - Iraqis hid in fighting positions until tanks were very near before attacking thus negating the use of the main gun

What we are doing about it

- Log R&D
- Quality
- Prototyping
- M&S
- SOCOM Cell

Bottom Line - Most Critical Need

- Lethality is cheap AND overwhelming
- Products worked well in Iraq
  - With areas for improvement
- Rapid Response to Urgent Needs a MUST!
  - Special Forces > Big Army
  - “Just-in-Time” ammo ???
  - Items in Design need to be ready to fight

Prox Fuze Baseline:
20 months Concept-to-First Kill
Is AGAIN the needed
cycle time ?